

FlexForum session VIII 28-04-22 notes

When 0815 – 1145, Thursday 12 May 2022

Where Virtual

Who Glen Baxter (Ara Ake), Shay Brazier (ReVolve Energy), John Campbell (Our Energy), Jason Christini-Crawford (Ecotricity), Glenn Coates (Aurora), Jenny Van der Merwe (Kāinga Ora), Terry Paddy (Cortexo), Eric Pyle (solarZero), Buddhika Rajapakse (Mercury), Tom Rose, (EVNex), Scott Scrimgeour (Wellington Electricity), Quintin Tahau (Transpower), James Tipping (Vector), Evie Trolove, (Orion), Mike Ullrich (Influx), Fiona Wiseman (Manawa),

Guests: Margaret Cooney, Alex Schoch, Octopus Energy; Che Lewis, Mick Richardson Transpower

Facilitator: Geoff Sharples

Secretariat: Craig Evans, Matt Smith

Session notes

Four topics were discussed:

1. Practical requirements for transacting flexibility – three items
 - a. Octopus Energy – a perspective from the UK
 - b. Transpower – insights from the demand response programme trial
 - c. Follow-up on South Island Distributor Group draft roadmap
2. Workplan, engagement and communications planning
3. Administration – governance, budget, and funding

Agenda overview

The group agreed the agenda.

Item 1: Octopus Energy – a perspective from the UK

Alex Schoch, Head of Flexibility, Octopus UK spoke to the group about how Octopus Energy UK procures and uses flexibility for price optimisation (customer and retail

portfolio) and to supply network services (constraint management), noting the difference between profile shaping (price-based flexibility) and active (contracted) flexibility.

Octopus has access to upstream and downstream flexibility resources with generation, front of meter flexibility and domestic flexibility. Flexibility resources will increase with electrification of transport and heating.

Octopus is a UK leader in smart retail tariffs / time-of-use (TOU) products. It's 3 main products are:

- static TOU product – this product has a 25% share of UK electric vehicle owners and obtains a price response which shifts about 150MW every day. Most charging starts within the TOU window even though it is hands off. Octopus offers the price, and the response comes from the customer action/decision
 - Octopus tested mitigations to the 'second peak' issue by creating a sub-product with different price windows. The test showed it could manage the profile of the portfolio to avoid network issues
- dynamic TOU – this product tracks day-ahead wholesale prices. This product has been in place for about 2 years. A profile change has been observed based on customer-led response
 - Octopus published an API that hardware providers have used to integrate with devices, eg, EV charger.¹ It's an arms-length approach
- managed charging – dispatchable dynamic TOU product which manages the customer resource to respond to actual market conditions. The product is for customers with larger loads, eg a household load of 7-9kW after electrifying transport or heating.
 - Octopus develops a charging schedule for every day for connected devices which reflect conditions based on a range of inputs (wholesale prices, transmission, distribution conditions etc), and may not align with the TOU 'window'.
 - The group discussed how this type of product filled a gap between price signals (eg, distribution charges) and actual conditions, and allowed flexibility to be obtained outside of a price-based flexibility mechanism (eg, outside the usual 'profile').

A key insight from its experience is to not underestimate the value of having the right wholesale and network price signals (ie, pricing of retail input costs) in place so parties can extract and deliver value by using customer price response to obtain flexibility.

¹ Information on the API is available here: <https://octopus.energy/blog/agile-smart-home-diy/>

Smart tariffs do procure flexibility. Price-based flexibility may not be as reliable as traditional resources, eg, generators, yet is more reliable than is commonly assumed.

- energy and network input costs in Great Britain provide fewer locational and temporal signals than available in Aotearoa. GB has a single wholesale price, ie, no locational signals). Distributors have variations in respective areas and a red/amber/green (peak/daytime/night-time) use of system charging mechanism. Octopus supports more dynamic pricing of inputs as this would enable development of more regional and bespoke retail prices / products which reflect locational value, eg, of energy or network congestion
- electrification of transport is the gateway to electrification – EVs are opening the mass-market to electrification of other loads (consumers realise that they can save money by switching tariffs 3-4 months after getting EV and begin to look at other opportunities)
- if the price provides a strong enough incentive, Octopus has found the customer will alter their behaviour and profile even without direct asset control. Most devices now have a basic scheduling function out of the box
- price signals complement contracted flexibility. Wholesale and network prices which provide relevant signals about market, system and network conditions allow flexibility providers to develop customer propositions which deliver the desired outcome by sharing the value of flexibility between the customer and ‘buyer’
 - flexibility contracts ideally will be longer term to be bankable. Octopus considers distribution charges should be set to do as much as possible to manage forecast network congestion
 - Take a first principles approach to determining granularity. Prices should provide locational and temporal signals which reflect settlement windows and are optimal for power system management.
- Flexibility is equivalent to a physical position and complements financial hedges. Increasing price volatility (in GB) with the exit of thermal plants and gas market turmoil means harnessing flexibility is necessary
- a register of DER and capability/functionality is worthwhile to support building scale and liquidity by reducing the cost of matching resources to buyers. Great Britain does not have a functional asset registration process. The open banking approach provides a model for developing a register.²

² Sidenote: The UK Department for Business, Energy & Industrial Strategy launched a competition in April 2022 to streamline the registration process for small-scale energy assets to improve data collection and improve the visibility of these resources. Refer <https://www.gov.uk/government/publications/automatic-asset-registration-aar-programme>

- common protocols are being developed. There is a risk that technical standards become outdated quickly. Avoid locking in standards that can result in practices which become outdated
- procurement of congestion relief services etc are not the panacea of congestion, but it is an effective tool for deferring network and transmission congestion and investment. Distribution products are procured through a multi-year ahead process.
 - procurement can be for both pre-fault and post-fault services. Most procurement in UK flexibility markets is for pre-fault services.
 - there is not a centralised dispatch platform which requires flexibility providers to integrate to multiple network systems. A single dispatch system would reduce transaction costs and barriers to entry. There is no preferred single dispatch platform for GB – most platforms were designed for trials, are not scalable, and are not fit-for-purpose

Octopus has observed that:

- the retailer / flexibility trader needs discretion to determine what signals to send to customers to avoid confusion. Expose customer to some signals, but not all, depending on their preferences
- responsiveness of customers is not necessarily related to household income. At this stage of the EV uptake cycle, most owners are higher income, and from an economic perspective should not be as price sensitive, yet they are – perhaps indicating that everyone loves a bargain?
- An implication of electrification of transport is to alter household spending. Electricity becomes the second or third biggest expense item after rent/mortgage payments but replaces fuel which was typically the third or fourth biggest expense item. This change in household expenditure is often only recognised after a couple of power bills.

Octopus outlined an example of it supplying flexibility to a distributor to manage a constraint – it is contracted to provide a sustain service and does this by ensuring no EV charging by its customers in a specific location before 1900. The distributor is managing capacity of a transformer, but the capacity shortfall does not meet the criteria for an upgrade.

Concluding points:

- don't treat households like mini-power stations, they should not and will not be able to meet the same performance criteria as large power stations.
- distributed resources will not perform in the same way as traditional resources, so require a different way of thinking about risk and contingency planning. This different 'reliability' doesn't mean they are not reliable

- price signals are powerful. Don't underestimate them
- use simple processes with common approaches – 100s of low voltage zones with slightly different (pricing) products at each is problematic for flexibility providers

Item 2: Transpower – a perspective from the demand response programme trial

Quintin Tahau, Che Lewis and Mick Richardson shared insights on the practical requirements for transacting flexibility gained from the Transpower demand response trial.

The demand response trial was an investigation into the viability of demand response as a transmission alternative undertaken after the Commerce Commission asked Transpower to consider non-transmission solutions.

At the time, the flattening of demand was creating greater uncertainty about the timing and need for network investment. Transpower was exploring options to provide a middle ground between doing nothing and investing in unnecessary infrastructure.

The goals of the trial were price discovery and identifying barriers to entry/participation:

- Price discovery. Transpower used a value of lost load (VoLL) of \$25,000/MW.³ It wanted to find out the price of demand response. used tenders to find out what price people were prepared to accept for their resource. No price guidance, simply provided the compensation structure, ie, establishment, event and availability payments
 - used pay as bid mechanism to find the marginal price. Participants could choose to supply or not at particular price points.
- Identify barriers to entry/offer. Used a price responsive programme so the initial commercial and industrial customer participants didn't need an intermediary. Intermediaries had a role when the trial was extended to households
 - adopted small block size, with a minimum of 2kw (and accepted lower amounts)
 - used a slimmed down contract (4 pages) based on the grid support contract (30 pages) designed to be accessible to non-lawyers

³ Value of lost load (VoLL) is a measure of the economic value given to an amount of electricity that is prevented from being delivered to consumers (ie, is 'unserved') due to a planned or unplanned outage of one or more components of the electricity supply chain. The VoLL provides a criteria for investment decisions; a solution which can be delivered for less than the VoLL will typically represent a net benefit to consumers. More information is available here: <https://www.ea.govt.nz/about-us/what-we-do/our-history/archive/dev-archive/work-programmes/transmission-work/investigation-of-the-value-of-lost-load/>

- a choice-based programme that did not penalise non-performance. Removing penalties cut out 10 pages of the contract, but this approach required extensive internal discussions. The choice-based approach reflected the experimental focus, including trying to discover response boundaries, eg, the maximum event duration before response fell away. Testing included an 8 hour event and ongoing daily events

Insights from the programme include:

- During the trial, special protection schemes (SPS) became more widely used. These were cheaper than VoLL and demand response for N-1 assets, and also able to be targeted to very specific geographical areas. Demand response is potentially preferred to SPS for N assets due to the investment deferral benefit.
- regulatory settings mean Transpower preferred infrastructure investments over procuring services
- Flexibility contracts should be easy to look at and accept to keep transaction costs low. Products need to be well defined, with common terms for each flexibility product type, ie, same description, terminology and requirements across the country
- Having a register of resources prior to going to market or an RFP is valuable. It allows the qualification process to occur separately to procurement, with prior assessment of asset capability, metering, establishing baselines (using a standardised method).
- Metering, measurement and verification are easy to overlook yet should be a focus
 - ‘check’ meters are suitable for measuring performance/delivery. Requiring measurement using the revenue meter raises the costs and complexity of using flexibility
 - when calling events, may not want it to wait to start until next half hourly window adding some limitations to use of standard smart meter data
 - an important contract term was a provision enabling Transpower to negotiate on behalf of the customer to obtain meter data
 - the group noted experience from the MTR pilot is that counterparties can agree protocols for data sharing and that the revenue meter isn’t needed. It also noted that Aurora and solarzero are not relying on meter data for the upper clutha project
 - the group noted the importance of explicitly recognising each specific data stream, its user and purpose, eg, distributor, consumer, flexibility provider etc

Transpower considers the key things to get right to enable transacting of flexibility are:

- Standard product definitions that do more than just describe the need (the situation). The product should have clear technical specifications of the solution, without specifying what the solution should be.
- The buyer should publish its price range, eg, as in UK where a range of prices is provided. The least cost capex option can become the ceiling price for flexible options
- Procurement should be centralised
- Contracts should be standard
- There needs to be shared industry and government vision. Government leadership is needed to provide a whole of system view and to avoid the cost of doing nothing.

Item 3: follow up on South Island Distributor Group draft roadmap

Glenn Coates provided a perspective on the alignment between the South Island distributor group roadmap and the FlexForum and posed some questions about how the two programmes can continue to be complementary.

- The FlexForum discovery and design phases are aligned with the SIDG roadmap phases 1 and 2, with support for the standardisation of procurement, contracting and communications protocols
- The FlexForum effort to develop standard product templates should align with the SIDG intention to try to procure flexibility, following on from a recent call for interest.
- The group noted the definitions of products and services are intended to provide a template to inform the solutions people provide, without prescribing the solution or resource.
- Areas where collaboration is possible depend on the future of the FlexForum. One area is to develop and encourage use of standard templates to be used in specific situations/procurements.
- The SIDG wants a discussion about the functional specification of a flexibility management system and what it actually need to do, the roles and interfaces. Aurora is adapting its ADMS to manage the Upper Clutha project but this is not a scalable solution

What does the FlexForum want from the SIDG? What particularly in phase 1 of its roadmap could be done to progress the FlexForum work more quickly?

- One outcome of the FlexForum process was implementation of the outputs. What can the SIDG and individual distributors do to demonstrate suitability of options/outputs in the short term?
- Collaboration on type and availability of information to assist DER owners with decisions to invest in flexibility for new/upgraded connections, including information about connection options and costs
- The SIDG could provide worked examples, based on existing or prior investment cases, detailing the technical requirements for the solution. The purpose would be to get feedback from flexibility providers into how flexibility buyers might ask for solutions given currently there is limited information on buyer needs

Item 4: Workplan, engagement and communications planning

The group discussed:

- options for obtaining feedback on the draft outputs for topics A and B
- scope and approach for delivering the remaining key tasks in the workplan

Options for obtaining feedback

The group agreed to several actions:

- members to coordinate targeted technical workshops, including for networks and community/DER owners
- circulate a link to the webinar recording, along with references to key questions raised in the webinar

Key remaining workplan tasks

The group agreed the following approach to delivering the key remaining workplan tasks:

- combine tasks 1 and 4. Secretariat to prepare a revised scope and arrange a discussion with interested members on scope and delivery
- task 3 to be delivered by Terry, Matt, Quintin and Mike
- tasks 2 and 5 to be developed by the secretariat.

5: Administration – governance, budget, and funding

The group discussed issues relating to governance, budget and funding.

End 1219